Sub-Element 4.a—Plume Phase Field Measurements and Analysis

What the Policy Says	
	Intent NUREG-0654 provides that OROs should have the capability to deploy field teams with the equipment, methods, and expertise necessary to determine the location of airborne radiation and particulate deposition on the ground from an airborne plume. In addition, NUREG-0654 indicates that OROs should have the capability to use field teams within the plume emergency planning zone to measure airborne radioiodine in the presence of noble gases and to detect radioactive particulate material in the airborne plume. In the event of an accident at a nuclear power plant, the possible release of radioactive material may pose a risk to the nearby population and environment. Although accident assessment methods are available to project the extent and magnitude of a release, these methods are subject to large uncertainties. During an accident, it is important to collect field radiological data in order to help characterize any radiological release. Adequate equipment and procedures are essential to such field measurement efforts. **Minimum Frequency** Criteria 4.a.1, 4.a.2, and 4.a.3 are to be evaluated in every full-participation exercise. (Each State within the 10-mile EPZ of a commercial nuclear power site shall fully participate in an exercise jointly with the licensee and appropriate local governments at least every 2 years. Each State with multiple sites within its boundaries shall fully participate in a joint exercise at some site on a rotational basis at least every 2 years. When not fully participating in an exercise at a site, the State shall partially participate at that site to support the full participation of the local governments.) **Criterion 4.a.1:** The field teams are equipped to perform field measurements of direct radiation exposure (cloud and ground shine) and to sample airborne radioiodine and particulates. (NUREG-0654, H.10; I.7, 8, 9). **Extent of Play** Field teams should be equipped with all instrumentation and supplies necessary to accomplish their mission. This should include instruments capable of measuring gamma exposure rates and detecting the presence of beta radiation. These instruments should be capable of measuring a range of activity and exposure, including radiological protection/exposure control of team members and detection of activity on the air sample collection media, consistent with the intended use of the instrument and the ORO's plans and procedures. An appropriate radioactive check source should be used to verify proper operational response for each low range radiation measurement instrument (less than 1 R/hr) and for high range instruments when available. If a source is not available for a high range instrument, a procedure should exist to operationally test the instrument before entering an area where only a high range instrument can make useful readings. All activities must be based on the ORO's plans and procedures and completed as they would be in an actual emergency, unless noted above or otherwise indicated in the extent of play agreement.

Preparing to Evaluate This Criterion	Before the exercise, determine, according to the ORO's plan/procedures and the Extent of Play agreement: • From what location is the field monitoring team to be dispatched? • What is the equipment and supply inventory for to the field monitoring teams? Consider radiation monitoring instrumentation, air sampling devices, and instrumentation to count air sample components • How are pre-deployment operational checks made on monitoring instruments? • What special methods are used for high range instruments? • Where will teams obtain spare equipment in the event of broken or out of specification instruments? • What adsorbent is used to collect a radioiodine sample and what is the required sample volume?
During the Exercise	During the exercise, in addition to evaluating activities related to the items listed above, be sure to: • Verify inventories of field instruments and supplies. • Observe operational checks. • Verify that spare equipment or instruments are obtained for missing, broken, or out of specification items.